

Left Atrial Mechanics in Advanced Diastolic Dysfunction and Preserved Ejection Fraction
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Objective : To characterize left atrial (LA) mechanics in patients (pts) with advanced left ventricular (LV) diastolic dysfunction (ADD) and preserved LV ejection fraction (LVEF).
Methods: The study group included 60 consecutive pts admitted for dyspnea with preserved LVEF ($\geq 50\%$) and ADD: pseudo-normal pattern (mitral E/A ratio 0.8-1.9, E deceleration time (Edt) 140-280ms) in 31 pts and restrictive pattern (E/A >2 , EDt <140 ms) in 29 pts. All pts had evidence of high LA pressure (mitral E / annular E' ≥ 14 or pulmonary venous S/D ratio <1.0). These were compared to 19 age-matched normal controls. Using 2D strain analysis peak positive longitudinal LA strain was measured. LA maximum, pre-A, and minimum volumes were also determined with the 2D strain software and LA phasic functional parameters (passive, conduit, and active) were calculated.
Results: Pts with ADD demonstrated low LA longitudinal strain, large LA volumes, and reduced passive and active LA emptying.

	Normal	Pseudonormal	Restrictive
n	19	31	29
LA Longitudinal strain (% stretching)	44 \pm 17	21 \pm 9*	20 \pm 10*
LA Volumes			
Vmax (ml)	58 \pm 11	114 \pm 34*	107 \pm 31*
Vpre-A (ml)	35 \pm 10	83 \pm 34*	75 \pm 29*
Vmin (ml)	17 \pm 9	56 \pm 22*	59 \pm 33*
Passive Emptying index (%)			
(Vmax - Vpre-A)/ Vmax	40 \pm 14	29 \pm 15*	31 \pm 15*
Conduit Volume (ml)			
LV stroke volume - (Vmax-Vmin)	26 \pm 16	11 \pm 21*	22 \pm 18**
Active Emptying index (%)			
(Vpre-A - Vmin)/ Vpre-A	44 \pm 13	31 \pm 16*	21 \pm 13*,**

* p <0.05 compared to normal, ** p <0.05 compared to pseudonormal

Conclusions: LA strain and phasic function parameters are abnormal in pts with ADD. These parameters may help in the diagnosis of ADD.